

THE AUSTRALIAN
LEATHER RESEARCH ASSOCIATION

AUSTRALIAN JOURNAL
OF CHEMISTRY

VOLUME 10

MELBOURNE
1957

AUSTRALIAN JOURNAL OF CHEMISTRY

Published by the Commonwealth Scientific and Industrial Research Organization. Volumes 1 to 5 of the Australian Journal of Physics and the Australian Journal of Chemistry issued as the Australian Journal of Scientific Research, Series A: Physical Sciences. Issued quarterly, £2 per annum.

BOARD OF STANDARDS

The Board of Standards for this Journal is appointed by the Commonwealth Scientific and Industrial Research Organization and the Australian Academy of Science and consists of Professor J. G. Wood (Chairman), Dr. N. S. Noble (Editor), Professor J. S. Anderson, Professor Sir Macfarlane Burnet, Professor Sir Leslie Martin, and Professor W. P. Rogers.

ADVISORY COMMITTEE

Acceptance of papers for this Journal is in the hands of an Advisory Committee appointed by the Board of Standards in consultation with the Royal Australian Chemical Institute and consisting of Dr. N. S. Noble (Chairman and Editor), Professor J. S. Anderson, Professor N. S. Bayliss, Professor R. J. W. Le Fèvre, and Dr. I. W. Wark.

All enquiries and manuscripts should be forwarded to:

The Editor,
Australian Journal of Chemistry,
Commonwealth Scientific and Industrial Research Organization,
314 Albert Street, East Melbourne, C.2, Victoria

MELBOURNE

CONTENTS

NUMBER 1, FEBRUARY 1957

	PAGE
The Mechanism of the Pinacol-Pinacone Rearrangement. IV. Exchange and Rearrangement with Hydrogen Isotopes. By J. F. Duncan and K. R. Lynn	1
The Mechanism of the Pinacol-Pinacone Rearrangement. V. Carbon Isotope Effects. By J. F. Duncan and K. R. Lynn	7
The Stretching Frequency of the Azo-Group. By R. J. W. Le Fèvre and R. L. Werner	26
The Permanganate-Coloured "Dimer" of Diphenylketen. By R. S. Armstrong and R. J. W. Le Fèvre	34
Reactions of Aroyl Peroxides. I. Benzoyl Peroxide with Benzene. By B. M. Lynch and K. H. Pausacker	40
Reactions of Aroyl Peroxides. II. Substituted Benzoyl Peroxides with Benzene. By K. H. Pausacker	49
The Separation of Sugars on Carbon Columns by Gradient Elution. By M. A. Jermyn	55
The Cardiac Glycosides of <i>Gomphocarpus fruticosus</i> R.Br. II. Gomphoside. By T. R. Watson and S. E. Wright	79

Short Communications

The Half-Life of Thorium C". By D. L. Baulch, H. A. David, and J. F. Duncan	85
The Determination of Depolarization Factors with Photoelectric Raman Spectrometers. By V. Cranmer and R. L. Werner	87
The Preparation of Some Trialkyl Esters of Orthoboric Acid. By K. G. O'Brien	91
The Isolation of Shikimic Acid from <i>Eucalyptus citriodora</i> Hook. By E. F. L. J. Anet, A. J. Birch, and R. A. Massy-Westropp	93

NUMBER 2, MAY 1957

	PAGE
Crystallographic Calculations on the SILLIAC Electronic Digital Computer. I. Fourier Syntheses. By H. C. Freeman	95
Rapid Reaction between Unifunctional Molecules and Molecules Unifunctional at One Position and <i>n</i> -Functional at Another. By H. G. Higgins	99
The Range-Energy Relation for α -Recoil Atoms. By D. L. Baulch and J. F. Duncan	112
The Ionization Constants of <i>p</i> -Aminobenzoic Acid in Aqueous Solution at 25 °C. By R. A. Robinson and A. I. Biggs	128
The Effect of Free Valencies on the Chemical Properties of Azacarbons and Carbons. By T. Gabor	135
Kinetics of the Reaction between Manganese Dioxide and Ferrous Ion. By D. F. A. Koch	150
The Mechanism of the Pinacol-Pinacone Rearrangement. VI. Low Temperature Kinetics. By J. F. Duncan and K. R. Lynn	160
Reactions of Aroyl Peroxides. III. Benzoyl Peroxide with Chlorobenzene, Naphthalene, and Nitrobenzene. By B. M. Lynch and K. H. Pausacker	165
The Alkaloids of <i>Lupinus varius</i> L. II. Alkaloids of the Leaf. By W. D. Crow and M. Michael	177
Chemistry of Non-Enzymic Browning. I. Reactions between Amino Acids, Organic Acids, and Sugars in Freeze-Dried Apricots and Peaches. By E. F. L. J. Anet and T. M. Reynolds	182
Chemistry of Non-Enzymic Browning. II. Some Crystalline Amino Acid-Deoxy-Sugars. By E. F. L. J. Anet	193
Water-Soluble Constituents of Fruit. VI. The Amino Acids in Apricots and Peaches. By T. M. Reynolds	198
<i>Short Communications</i>	
Diffusion of Thallium (ThC ⁺) Ions in Air. By D. L. Baulch, J. F. Duncan, and J. P. Ryan	203
Surface Conductance and Thixotropy. By N. Street	207
Some Non-Alkaloidal Constituents of the Bark of <i>Teclea grandifolia</i> Engl. By E. Gellert	209

NUMBER 3, AUGUST 1957

	PAGE
The π -Electron Distribution in Pyridine and the Molecular-Orbital Parameters for Nitrogen. By R. D. Brown and M. L. Heffernan	211
The Molar Kerr Constants, Dipole Moments, and Relaxation Times of Methyl and Ethyl Maleates and Fumarates, Ethyl Formate, Diethyl Oxalate, and of Ethyl and Propyl Azodiformates. By Catherine G. Le Fèvre, R. J. W. Le Fèvre, and W. T. Oh	218
Spectra of Sulphonyl Derivatives. III. Interaction with Attached Groups. By D. E. Freeman and A. N. Hambly	227
Spectra of Sulphonyl Derivatives. IV. Sulphonic Esters. By D. E. Freeman and A. N. Hambly	239
Thermodynamic Data from Gas-Liquid Partition Chromatography. By J. R. Anderson and K. H. Napier	250
Electrostatic, Polar, and Steric Factors in the Acid Hydrolysis of the Dipeptides. By R. J. L. Martin	256
The Kinetics of the Acid Hydrolysis of Some Dipeptides in Acetic Acid. By R. J. L. Martin	268
Ionization of Picric Acid in Methanol to 3000 Atm. By W. Strauss	277
The Formation of the Hexabromopalladate(II) Ion. By C. M. Harris, S. E. Livingstone, and I. H. Reece	282
A Study on Magnesium Oxysulphates. By Thaisa Demediuk and W. F. Cole	287
A New Interpretation of the Acidic and Basic Structures in Carbons. I. Lactone Groups of the Ordinary and Fluorescein Types in Carbons. By V. A. Garten, D. E. Weiss, and J. B. Willis	295
A New Interpretation of the Acidic and Basic Structures in Carbons. II. The Chromene-Carbonium Ion Couple in Carbon. By V. A. Garten and D. E. Weiss	309
Arylation of Aromatic Compounds. IV. Iodosobenzene Dibenzoates with Nitrobenzene and Chlorobenzene. By B. M. Lynch and K. H. Pausacker	329
Methylsteroids. III. Reduction of Ketones Derived from Lanosterol. By C. S. Barnes and A. Palmer	334
The Binding of Zinc by <i>S</i> -Carboxymethyl Keratine 2 from Wool. By J. M. Gillespie and P. H. Springell	344
The Chemistry of Ants. II. Structure and Configuration of Iridolactone (<i>iso</i> Iridomyrmecin). By G. W. K. Cavill and H. D. Locksley	352

NUMBER 3, AUGUST 1957 (*Continued*)

	PAGE
<i>Short Communications</i>	
Calculation of Partial Molar Volume Changes at High Pressures. By W. Strauss	359
Infra-Red Absorption Spectra of Metal Hyporites. By R. J. W. Le Fèvre, W. T. Oh, I. H. Reece, and R. L. Werner	361
Ionized States of Molecular Crystals. By L. E. Lyons	365
A Carbonato Complex of Molybdenum $K_6Mo(CO_3)_5 \cdot 2H_2O$. By M. C. Steele	367
An Oxalato Complex of Molybdenum $(NH_4)_4Mo(Ox)_4 \cdot 8H_2O$. By M. C. Steele	368
Methylsteroids. IV. Wolff-Kishner Reductions of Diketones Derived from Lanosterol. By C. S. Barnes	370

NUMBER 4, NOVEMBER 1957

	PAGE
Quantal Factors in the Joule-Thomson Cooling of Hydrogen and Deuterium. By S. D. Hamann.. .. .	373
Nucleophilic Substitution Reactions at High Pressure. By W. Strauss..	381
Magnetic Susceptibility of Tri-Coordinated Copper(II) Complexes. By M. Kishita, Y. Muto, and M. Kubo	386
An Electrokinetic Study by the Streaming Potential Method of Ion Exchange at Oxide Mineral Surfaces. By P. G. Johansen and A. S. Buchanan	392
An Application of the Microelectrophoresis Method to the Study of the Surface Properties of Insoluble Oxides. By P. G. Johansen and A. S. Buchanan	398
A New Complex Cyanide of Molybdenum. By M. C. Steele	404
The Catalytic Hydrogenation of Benzene and Toluene over Evaporated Films of Nickel and Tungsten. By J. R. Anderson	409
Heats of Mixing. III. Acetone and Alcohol Solutions. By I. Brown and W. Fock	417
Liquid-Vapour Equilibria. VIII. The Systems Acetone+Benzene and Acetone+Carbon Tetrachloride at 45 °C. By I. Brown and F. Smith	423
Chemistry of Polynuclear Compounds. I. The Infra-Red Spectra of Some Polynuclear Quinones and Polynuclear Aromatic Hydrocarbons. By R. A. Durie, Ruth E. Lack, and J. S. Shannon	429
Synthesis of Some Substances Related to <i>p</i> -Nitrophenyl- β -glucoside and of 4- <i>O</i> -Methyl Glucose through Crystalline Intermediates. By M. A. Jermyn	448
Separation of Monomethylated <i>p</i> -Nitrophenyl- β -glucosides on a Carbon Column. By M. A. Jermyn	455
Oxidations with Iodosobenzene Diacetate. VII. The Oxidation of <i>p</i> -Nitro- <i>N</i> -methylaniline. By Joan Mitchell and K. H. Pausacker..	460
The Alkaloids of <i>Crotalaria retusa</i> L. By C. C. J. Culvenor and L. W. Smith	464
The Alkaloids of <i>Crotalaria spectabilis</i> Roth. By C. C. J. Culvenor and L. W. Smith	474
The Chemical Constituents of Australian <i>Flindersia</i> species. X. The Constituents of <i>F. dissosperma</i> (F. Muell.) Domin and Its Relationship to <i>F. maculosa</i> (Lindl.) F. Muell. By Sylvia V. Binns, B. Halpern, the Late G. K. Hughes, and E. Ritchie	480
The Isolation and Identification of 5-Hydroxypiperidine-2-carboxylic Acid from <i>Leucaena glauca</i> Benth. By M. P. Hegarty	484

NUMBER 4, NOVEMBER 1957 (*Continued*)

	PAGE
<i>Short Communications</i>	
New Compounds of Molybdenum(III) with Bidentate Ligands. By M. C. Steele	489
The Complex Chlorides of Molybdenum(III). By R. J. Irving and M. C. Steele	490
Charge Distribution and Dipole Moment of Pyridine. By R. D. Brown and M. L. Heffernan	493
The Use of Potassium Chloride Disks in the Infra-Red Examination of Fibrous Cellulose and Other Solid Materials. By H. G. Higgins ..	496
Studies in the Chemistry of Phenothiazine. III. Attempts to Prepare Some Pentacyclic Compounds. By K. J. Farrington and W. K. Warburton	502
Preparation of Phloroglucinol Trimethyl Ether. By J. W. Clark-Lewis..	505
Change of 2,4-Dinitrophenylhydrazones on Alumina and Silica Gel Chromatographic Columns. By D. A. Forss and E. A. Dunstone	506
The Volatile Leaf Oil of <i>Melaleuca ericifolia</i> Sm. By R. O. Hellyer ..	509
Index to Volume 10	513



A

A

A

A

A

A

A

A

A

A

A

A

A

P

A

A

INDEX

	PAGE		PAGE
Absorption Spectra of Metal Hyponitrites	361	Anet, E. F. L. J.— Chemistry of Non-Enzymic Browning. II. Some Crystalline Amino Acid-Deoxy-Sugars	193
Acetic Acid, Acid Hydrolysis of Dipeptides in	268	Anet, E. F. L. J., Birch, A. J., and Massy - Westropp, R. A.— The Isolation of Shikimic Acid from <i>Eucalyptus citriodora</i> Hook.	93
Acetone and Alcohol Solutions (Heats of Mixing)	417	Anet, E. F. L. J., and Reynolds, T. M.— Chemistry of Non-Enzymic Browning. I. Reactions between Amino Acids, Organic Acids, and Sugars in Freeze-Dried Apricots and Peaches	182
Acetone + Benzene and Acetone + Carbon Tetrachloride at 45 °C (Liquid-Vapour Equilibria)	423	Ants, The Chemistry of	352
Acid Hydrolysis of Dipeptides	256, 268	Apricots and Peaches, Amino Acids in	198
Acidic and Basic Structures in Carbons	295, 309	Apricots and Peaches, Freeze-Dried, Reaction between Amino Acids, Organic Acids, and Sugars in	182
Alcohol and Acetone Solutions (Heats of Mixing)	417	Armstrong, R. S., and Le Fèvre, R. J. W.— The Permanganate - Coloured "Dimer" of Diphenylketen	34
Alkaloids of <i>Crotalaria retusa</i> L.	464	Aromatic Compounds, Arylation of	329
Alkaloids of <i>Crotalaria spectabilis</i> Roth.	474	Aroyl Peroxides, Reactions of	40, 49, 165
Alkaloids of <i>Lupinus varius</i> L.	177	Arylation of Aromatic Compounds	329
Alumina and Silica Gel Columns, Change of 2,4-Dinitrophenylhydrazones on	506	Atoms, The Range-Energy Relation for α -Recoil	112
Amino Acid-Deoxy-Sugars	193	Azacarbons and Carbons, The Chemical Properties of, Effect of Free Valencies on	135
Amino Acids, Organic Acids, and Sugars in Apricots and Peaches, Reaction between	182		
<i>p</i> -Aminobenzoic Acid in Aqueous Solutions at 25 °C, The Ionization Constants of	128		
Anderson, J. R.— The Catalytic Hydrogenation of Benzene and Toluene over Evaporated Films of Nickel and Tungsten	409		
Anderson, J. R., and Napier, K. H.— Thermodynamic Data from Gas - Liquid Partition Chromatography	250		

	PAGE		PAGE
Azodiformates, Ethyl and Propyl, The Molar Kerr Constants, Dipole Moments, and Relaxation Times of ..	218	Binns, Sylvia V., Halpern, B., Hughes, G. K., and Ritchie, E.—	
Azo-Group, The Stretching Frequency of the	26	The Chemical Constituents of Australian <i>Flindersia</i> Species. X. The Constituents of <i>F. dissosperma</i> (F. Muell.) Domin and Its Relationship to <i>F. maculosa</i> (Lindl.) F. Muell. ..	480
Barnes, C. S.—		Birch, A. J.—	
Methylsteroids. IV. Wolff-Kishner Reductions of Diketones Derived from Lanosterol	370	See Anet, E. F. L. J., and Massy-Westropp, R. A. ..	93
Barnes, C. S., and Palmer, A.—		Brown, I., and Fock, W.—	
Methylsteroids. III. Reduction of Ketones Derived from Lanosterol	334	Heats of Mixing. III. Acetone and Alcohol Solutions ..	417
Baulch, D. L., David, H. A., and Duncan, J. F.—		Brown, I., and Smith, F.—	
The Half-Life of Thorium C ²³² ..	85	Liquid-Vapour Equilibria. VIII. The Systems Acetone + Benzene and Acetone + Carbon Tetrachloride at 45 °C ..	423
Baulch, D. L., and Duncan, J. F.—		Brown, R. D., and Heffernan, M. L.—	
The Range-Energy Relation for α -Recoil Atoms ..	112	Charge Distribution and Dipole Moment of Pyridine ..	493
Baulch, D. L., Duncan, J. F., and Ryan, J. P.—		The π -Electron Distribution in Pyridine and the Molecular-Orbital Parameters for Nitrogen ..	211
Diffusion of Thallium (ThC ²⁰¹) Ions in Air	203	Browning, Non-Enzymic, The Chemistry of	182, 193
Benzene + Acetone and Acetone + Carbon Tetrachloride at 45 °C (Liquid-Vapour Equilibria)	423	Buchanan, A. S.—	
Benzene and Toluene, Hydrogenation of, over Evaporated Films of Nickel and Tungsten ..	409	See Johansen, P. G. ..	392, 398
Benzene, Benzoyl Peroxides with	40, 49	Carbon Column Separation of <i>p</i> -Nitrophenyl- β -glucosides ..	455
Benzoyl Peroxide with Chlorobenzene, Naphthalene, and Nitrobenzene	165	Carbon Isotope Effects ..	7
Benzoyl Peroxides with Benzene	40, 49	Carbon Tetrachloride + Acetone and Acetone + Benzene at 45 °C (Liquid-Vapour Equilibria) ..	423
Bidentate Ligands, New Compounds of Molybdenum(III) with	489	Carbonato Complex of Molybdenum, A	367
Biggs, A. I.—		Carbons, A New Interpretation of the Acidic and Basic Structures in	295, 309
See Robinson, R. A. ..	128	Carbons and Azacarbons, The Chemical Properties of, Effect of Free Valencies on	135

PAGE	PAGE
S-Carboxymethyl Keratine 2 from Wool, The Binding of Zinc by 344	Crow, W. D., and Michael, M.— The Alkaloids of <i>Lupinus</i> <i>varius</i> L. II. Alkaloids of the Leaf 177
Cardiac Glycosides of <i>Gompho-</i> <i>carpus fruticosus</i> R.Br. .. 79	Crystallographic Calculations on the SILLIAC Electronic Digital Computer 95
Catalytic Hydrogenation of Benzene and Toluene over Evaporated Films of Nickel and Tungsten 409	Culvenor, C. C. J., and Smith, L. W.— The Alkaloids of <i>Crotalaria</i> <i>retusa</i> L. 464
Cavill, G. W. K., and Locksley, H. D.— The Chemistry of Ants. II. Structure and Configura- tion of Iridolactone (<i>iso-</i> <i>Iridomyrmecin</i>) 352	The Alkaloids of <i>Crotalaria</i> <i>spectabilis</i> Roth. 474
Cellulose and Other Solid Materials, The Infra-Red Examination of Fibrous .. 496	Cyanide of Molybdenum, A New Complex 404
Charge Distribution and Dipole Moment of Pyridine .. 493	David, H. A.— <i>See</i> Baulch, D. L., and Duncan, J. F. 85
Chlorobenzene and Nitrobenzene, Iodosobenzene Dibenzoates with 329	Demediuk, Thaisa, and Cole, W. F.— A Study on Magnesium Oxy- sulphates 287
Chlorobenzene, Naphthalene, and Nitrobenzene, Benzoyl Peroxide with 165	Depolarization Factors, The Determination of, with Photo- electric Raman Spectrometers 87
Chromatography, Gas-Liquid Partition, Thermodynamic Data from 250	Deuterium and Hydrogen, Quantal Factors in the Joule- Thomson Cooling of 373
Chromene - Carbonium Ion Couple in Carbon 309	Diffusion of Thallium (ThC ⁺) Ions in Air 203
Clark-Lewis, J. W.— Preparation of Phloroglucinol Trimethyl Ether 505	Digital Computer, Electronic Crystallographic Calculations on the 95
Cole, W. F.— <i>See</i> Demediuk, Thaisa .. 287	Diketones derived from Lano- sterol, Reductions of .. 370
Conductance, Surface, and Thixotropy 207	"Dimer" of Diphenylketen, The Permanganate-Coloured 34
Copper(II) Complexes, Magnetic Susceptibility of Tri-Co- ordinated 386	2,4-Dinitrophenylhydrazones on Alumina and Silica Gel Columns, Change of .. 506
Cranmer, V., and Werner, R. L.— The Determination of De- polarization Factors with Photoelectric Raman Spec- trometers 87	Dipeptides, Acid Hydrolysis of the 256, 268
<i>Crotalaria retusa</i> L., The Alkaloids of 464	Diphenylketen, The Perma- nganate-Coloured "Dimer" of 34
<i>Crotalaria spectabilis</i> Roth., The Alkaloids of 474	Dipole Moment and Charge Dis- tribution of Pyridine .. 493
	Dipole Moments of Methyl and Ethyl Maleates and Fumarates 218

	PAGE		PAGE
Disks in the Infra-Red Examination of Fibrous Cellulose and Other Solid Materials, The Use of Potassium Chloride ..	496	Farrington, K. J., and Warburton, W. K.—	
Duncan, J. F., and Lynn, K. R.—		Studies in the Chemistry of Phenothiazine. III. Attempts to Prepare Some Pentaacyclic Compounds ..	502
The Mechanism of the Pinacol-Pinacone Rearrangement—		Ferrous Ion and Manganese Dioxide, The Reaction between ..	150
IV. Exchange and Rearrangement with Hydrogen Isotopes ..	1	Fibrous Cellulose and Other Solid Materials, The Use of Potassium Chloride Disks in the Infra-Red Examination of	496
V. Carbon Isotope Effects ..	7	Films, Hydrogenation of Benzene and Toluene Over Evaporated Nickel and Tungsten ..	409
VI. Low Temperature Kinetics ..	160	<i>Flindersia dissosperma</i> (F. Muell.)	
Duncan, J. F.—		Domin, The Constituents of ..	480
See Baulch, D. L. ..	112	Fluorescein Types in Carbons ..	295
See Baulch, D. L., and David, H. A. ..	85	Fock, W.—	
See Baulch, D. L., and Ryan, J. P. ..	203	See Brown, I. ..	417
Dunstone, E. A.—		Formate, Diethyl, The Molar Kerr Constants, Dipole Moments, and Relaxation Times of ..	218
See Forss, D. A. ..	506	Forss, D. A., and Dunstone, E. A.—	
Durie, R. A., Lack, Ruth E., and Shannon, J. S.—		Change of 2,4-Dinitrophenylhydrazones on Alumina and Silica Gel Chromatographic Columns ..	506
Chemistry of Polynuclear Compounds. I. The Infra-Red Spectra of Some Polynuclear Quinones and Polynuclear Aromatic Hydrocarbons ..	429	Fourier Syntheses ..	95
π -Electron Distribution in Pyridine ..	211	Freeman, D. E., and Hambly, A. N.—	
Electrokinetic Study by Streaming Potential Method of Ion Exchange at Oxide Mineral Surfaces ..	392	Spectra of Sulphonyl Derivatives—	
Electronic Digital Computer, Crystallographic Calculations on the SILLIAC ..	95	III. Interaction with Attached Groups ..	227
Electrostatic, Polar, and Steric Factors in the Acid Hydrolysis of the Dipeptides ..	256	IV. Sulphonic Esters ..	239
Energy-Range Relation for α -Recoil Atoms ..	112	Freeman, H. C.—	
Esters of Orthoboric Acid, The Preparation of Some Trialkyl	91	Crystallographic Calculations on the SILLIAC Electronic Digital Computer. I. Fourier Syntheses ..	95
Esters, Sulphonic ..	239	Frequency of the Azo-Group, The Stretching ..	26
Ether, Preparation of Phloroglucinol Trimethyl ..	505	Fruit, Water-Soluble Constituents of ..	198
<i>Eucalyptus citriodora</i> Hook., The Isolation of Shikimic Acid from ..	93	Fumarates, The Molar Kerr Constants, Dipole Moments, and Relaxation Times of Methyl and Ethyl ..	218

PAGE	PAGE
Gabor, T.— The Effect of Free Valencies on the Chemical Properties of Azacarbonyl and Carbons 135	Harris, C. M., Livingstone, S. E., and Reece, I. H.— The Formation of the Hexa- bromopalladate(II) Ion .. 282
Garten, V. A., and Weiss, D. E.— A New Interpretation of the Acidic and Basic Structures in Carbons. II. The Chromene-Carbonium Ion Couple in Carbon .. 309	Heats of Mixing 417
Garten, V. A., Weiss, D. E., and Willis, J. B.— A New Interpretation of the Acidic and Basic Structures in Carbons. I. Lactone Groups of the Ordinary and Fluorescein Types in Carbons 295	Heffernan, M. L.— See Brown, R. D. .. 211, 493
Gellert, E.— Some Non-Alkaloidal Con- stituents of the Bark of <i>Teclea grandifolia</i> Engl. .. 209	Hegarty, M. P.— The Isolation and Identifica- tion of 5-Hydroxy- piperidine-2-carboxylic Acid from <i>Leucaena glauca</i> Benth. 484
Gillespie, J. M., and Springell, P. H.— The Binding of Zinc by 8- Carboxymethyl Keratine 2 from Wool 344	Hellyer, R. O.— The Volatile Leaf Oil of <i>Melaleuca ericifolia</i> Sm. .. 509
Glucose, Synthesis of 4-O- Methyl. 448	Hexabromopalladate(II) Ion, The Formation of 282
β -Glucoside, Synthesis of Some Substances Related to <i>p</i> - Nitrophenyl- 448	Higgins, H. G.— Rapid Reaction between Uni- functional Molecules and Molecules Unifunctional at One Position and <i>n</i> -Func- tional at Another .. 99
β -Glucosides, Separation of Monomethylated <i>p</i> -Nitro- phenyl- 455	The Use of Potassium Chloride Disks in the Infra-Red Examination of Fibrous Cellulose and Other Solid Materials 496
Glycosides, The Cardiac, of <i>Gomphocarpus fruticosus</i> R.Br. 79	Hughes, G. K.— See Binns, Sylvia V., Halpern, B., and Ritchie E. .. 480
Gomphoside 79	Hydrazones, 2,4-Dinitrophenyl- Change on Alumina and Silica Gel Columns 506
Halpern, B.— See Binns, Sylvia V., Hughes, G. K., and Ritchie, E. .. 480	Hydrogen and Deuterium, Quantal Factors in the Joule- Thomson Cooling of. . . 373
Hamann, S. D.— Quantal Factors in the Joule- Thomson Cooling of Hydrogen and Deuterium 373	Hydrogen Isotopes, Exchange and Rearrangement with .. 1
Hamby, A. N.— See Freeman, D. E. . . 227, 239	Hydrolysis of Dipeptides 256, 268
	5 - Hydroxypiperidine - 2 - carboxylic Acid from <i>Leucaena glauca</i> Benth., The Isolation and Identification of .. 484
	Infra-Red Absorption Spectra of Metal Hyponitrites .. 361
	Infra - Red Examination of Fibrous Cellulose, The Use of Potassium Chloride Disks in the 496
	Infra-Red Spectra of Some Quinones 492

	PAGE		PAGE
Iodosobenzene Dibenzoates with Nitrobenzene and Chlorobenzene	329	Kerateine 2 from Wool, The Binding of Zinc by <i>S</i> -Carboxymethyl	344
Iodosobenzene Diacetate, Oxidations with	460	Kerr Constants of Methyl and Ethyl Maleates and Fumarates	218
Ion Exchange at Oxide Mineral Surfaces	392	Ketones derived from Lanosterol, Reduction of	334
Ionization Constants of <i>p</i> -Aminobenzoic Acid	128	Kinetics, Low Temperature (Pinacol-Pinacone)	160
Ionization of Picric Acid in Methanol to 3000 Atm	277	Kinetics of the Acid Hydrolysis of Some Dipeptides in Acetic Acid	268
Ionized States of Molecular Crystals	365	Kinetics of the Reaction between Manganese Dioxide and Ferrous Ion	150
Ions in Air, Diffusion of Thallium (ThC")	203	Kishita, M., Muto, Y., and Kubo, M.— Magnetic Susceptibility of Tri-Coordinated Copper(II) Complexes	386
Iridolactone (<i>iso</i> Iridomyrmecin), Structure and Configuration of	352	Koch, D. F. A.— Kinetics of the Reaction between Manganese Dioxide and Ferrous Ion	150
Irving, R. J., and Steele, M. C.— The Complex Chlorides of Molybdenum(III)	490	Kubo, M.— <i>See</i> Kishita, M., and Muto, Y.	386
Isotope Effects, Carbon	7	Lack, Ruth E.— <i>See</i> Durie, R. A., and Shannon, J. S.	429
Isotopes, Exchange and Rearrangement with Hydrogen	1	Lactone Groups of the Ordinary and Fluorescein Types in Carbons	295
Jermyn, M. A.— Separation of Monomethylated <i>p</i> -Nitrophenyl- β -glucosides on a Carbon Column	455	Lanosterol, Reduction of Ketones derived from	334, 370
Synthesis of Some Substances Related to <i>p</i> -Nitrophenyl- β -glucoside and of 4- <i>O</i> -Methyl Glucose through Crystalline Intermediates	448	Le Fèvre, Catherine G., Le Fèvre, R. J. W., and Oh, W. T.— The Molar Kerr Constants, Dipole Moments, and Relaxation Times of Methyl and Ethyl Maleates and Fumarates, Ethyl Formate, Diethyl Oxalate, and of Ethyl and Propyl Azodiformates	218
The Separation of Sugars on Carbon Columns by Gradient Elution	55	Le Fèvre, R. J. W., Oh, W. T., Reece, I. H., and Werner, R. L.— Infra-Red Absorption Spectra of Metal Hyponitrites	361
Johansen, P. G., and Buchanan, A. S.— An Application of the Microelectrophoresis Method to the Study of the Surface Properties of Insoluble Oxides	398		
An Electrokinetic Study by the Streaming Potential Method of Ion Exchange at Oxide Mineral Surfaces	392		
Joule-Thomson Cooling of Hydrogen and Deuterium, Quantal Factors in the	373		

PAGE	PAGE
Le Fèvre, R. J. W., and Werner, R. L.— The Stretching Frequency of the Azo-Group 26	Martin, R. J. L.— Electrostatic, Polar, and Steric Factors in the Acid Hydrolysis of the Dipeptides 256
Le Fèvre, R. J. W.— See Armstrong, R. S. .. 34	The Kinetics of the Acid Hydrolysis of Some Di- peptides in Acetic Acid .. 268
See Le Fèvre, Catherine G., and Oh, W. T. 218	Massy-Westropp, R. A.— See Anet, E. F. L. J., and Birch, A. J. .. . 93
<i>Leucaena glauca</i> Benth., The Isolation and Identification of 5 - Hydroxypiperidine - 2 - carboxylic Acid from .. 484	<i>Melaleuca ericifolia</i> Sm., Volatile Leaf Oil of 509
Liquid-Vapour Equilibria .. 423	Methylsteroids 334, 370
Livingstone, S. E.— See Harris, C. M., and Reece, I. H. 282	4-O-Methyl Glucose, Synthesis of .. . 448
Locksley, H. D.— See Cavill, G. W. K. .. 352	Michael, M.— See Crow, W. D. 177
<i>Lupinus varius</i> L., The Alkaloids of 177	Microelectrophoresis Method, An Application of the 398
Lynch, B. M., and Pausacker, K. H.— Arylation of Aromatic Com- pounds. IV. Iodosobenzene Dibenzoates with Nitro- benzene and Chlorobenzene 329	Mitchell, Joan, and Pausacker, K. H.— Oxidations with Iodoso- benzene Diacetate. VII. The Oxidation of <i>p</i> -Nitro- N-methylaniline 460
Reactions of Aroyl Peroxides— I. Benzoyl Peroxide with Benzene 40	Molar Kerr Constants of Methyl and Ethyl Maleates and Fumarates 218
III. Benzoyl Peroxide with Chlorobenzene, Naph- thalene, and Nitro- benzene 165	Molar Volume Changes at High Pressures, Calculation of Partial 359
Lynn, K. R.— See Duncan, J. F. .. 1, 7, 160	Molecular Crystals, Ionized States of 365
Lyons, L. E.— Ionized States of Molecular Crystals 365	Molecular-Orbital Parameters for Nitrogen 211
Magnesium Oxysulphates, A Study on 287	Molecules, Rapid Reaction between Unifunctional .. 99
Magnetic Susceptibility of Tri- Coordinated Copper(II) Com- plexes 386	Molybdenum, A Carbonato Complex of 367
Maleates, The Molar Kerr Con- stants, Dipole Moments, and Relaxation Times of Methyl and Ethyl 218	Molybdenum, A New Complex Cyanide of 404
Manganese Dioxide and Ferrous Ion, The Reaction between.. 150	Molybdenum, An Oxalato Complex of 368
	Molybdenum(III), The Complex Chlorides of 490
	Molybdenum(III) with Bidentate Ligands, New Compounds of 489

	PAGE		PAGE
Pyridine, Charge Distribution and Dipole Moment of ..	493	Silica Gel and Alumina Columns, Change of 2,4-Dinitrophenylhydrazones on ..	506
Pyridine, π -Electron Distribution in..	211	SILLIAC Electronic Digital Computer, Crystallographic Calculations on the ..	95
Quantal Factors in the Joule-Thomson Cooling of Hydrogen and Deuterium ..	373	Smith, F.— See Brown, I. ..	423
Quinones, The Infra-Red Spectra of Some ..	429	Smith, L. W. ..	464, 474
Raman Spectrometers, The Determination of Depolarization Factors with Photoelectric ..	87	Spectra of Metal Hyponitrites, Infra-Red Absorption ..	361
Range - Energy Relation for α -Recoil Atoms ..	112	Spectra of Some Quinones, Infra-Red ..	429
Reaction between Unifunctional Molecules ..	99	Spectra of Sulphonyl Derivatives ..	227
α -Recoil Atoms, Range-Energy Relation for ..	112	Springell, P. H.— See Gillespie, J. M. ..	344
Reece, I. H.— See Harris, C. M., and Livingstone, S. E. ..	282	Steele, M. C.— A Carbonato Complex of Molybdenum $K_4Mo(CO_3)_5 \cdot 2H_2O$..	367
See Le Fèvre, R. J. W., Oh, W. T., and Werner, R. L. ..	361	A New Complex Cyanide of Molybdenum ..	404
Relaxation Times of Methyl and Ethyl Maleates and Fumarates ..	218	An Oxalato Complex of Molybdenum $(NH_4)_4Mo(Ox)_4 \cdot 8H_2O$..	368
Reynolds, T. M.— Water-Soluble Constituents of Fruit. VI. The Amino Acids in Apricots and Peaches..	198	New Compounds of Molybdenum(III) with Bidentate Ligands ..	489
See Anet, E. F. L. J. ..	182	See Irving, R. J. ..	490
Ritchie, E.— See Binns, Sylvia V., Halpern, B., and Hughes, G. K. ..	480	Steric, Polar, and Electrostatic Factors in the Acid Hydrolysis of Dipeptides ..	256
Robinson, R. A., and Biggs, A. I.— The Ionization Constants of <i>p</i> -Aminobenzoic Acid in Aqueous Solution at 25 °C ..	128	Strauss, W.— Calculation of Partial Molar Volume Changes at High Pressures ..	359
Ryan, J. P.— See Baulch, D. L., and Duncan, J. F. ..	203	Ionization of Picric Acid in Methanol to 3000 Atm ..	277
Shannon, J. S.— See Durie, R. A., and Lack, Ruth E. ..	429	Nucleophilic Substitution Reactions at High Pressure ..	381
Shikimic Acid from <i>Eucalyptus citriodora</i> Hook., The Isolation of ..	93	Streaming Potential Method of Ion Exchange at Oxide Mineral Surfaces ..	392
		Street, N.— Surface Conductance and Thixotropy ..	207
		Stretching Frequency of the Azo-Group, The ..	26
		Sugars, Amino Acid-Deoxy- ..	193

	PAGE		PAGE
Sugars, Amino Acids, and Organic Acids, Reactions between	182	Tungsten and Nickel Films, Hydrogenation of Benzene and Toluene over Evaporated ..	409
Sugars, The Separation of ..	55	Valencies, The Effect of Free on Azacarbons and Carbons ..	135
Sulphonic Esters	239	Warburton, W. K.— See Farrington, K. J. ..	502
Sulphonyl Derivatives, Spectra of	227, 239	Water-Soluble Constituents of Fruit	198
Surface Conductance and Thixotropy	207	Watson, T. R., and Wright, S. E.— The Cardiac Glycosides of <i>Gomphocarpus fruticosus</i> R.Br. II. Gomphoside ..	79
Surface Properties of Insoluble Oxides, An Application of the Microelectrophoresis Method to the Study of the ..	398	Weiss, D. E.— See Garten, V. A.	309
Surfaces, The Electrokinetic Study by the Streaming Potential Method of Ion Exchange at Oxide Mineral ..	392	See Garten, V. A., and Willis, J. B.	295
<i>Teclea grandifolia</i> Engl., Some Non-Alkaloidal Constituents of	209	Werner, R. L.— See Cranmer, V.	87
Thallium (ThC ⁺) Ions in Air, Diffusion of	203	See Le Fèvre, R. J. W. ..	26
Thermodynamic Data from Gas-Liquid Partition Chromatography	250	See Le Fèvre, R. J. W., Oh, W. T., and Reece, I. H. ..	361
Thixotropy and Surface Conductance	207	Willis, J. B.— See Garten, V. A., and Weiss, D.E.	295
Thorium C ⁺ , The Half-Life of ..	85	Wolff-Kishner Reduction of Diketones derived from Lanosterol	370
Toluene and Benzene over Evaporated Films of Nickel and Tungsten, Hydrogenation of	409	Wool, The Binding of Zinc by S-Carboxymethyl Keratine 2 from	344
Triakyl Esters of Orthoboric Acid, The Preparation of Some ..	91	Wright, S. E.— See Watson, T. R.	79
		Zinc, The Binding of	344

